

REMARKS

Applicant has studied the Office Action dated January 23, 2008 and has made amendments to the claims. It is submitted that the application, as amended, is in condition for allowance. By virtue of this amendment, claims 1-21 are pending.

Reconsideration and allowance of the pending claims in view of the above amendments and the following remarks are respectfully requested. In the Office Action, the Examiner:

- Objected to Claims 7, 12 and 13 due to informalities.
- Rejected claims 1, 3-5, 9-11, 13-15, 18 and 20 under 35 U.S.C §102(b) as being anticipated by Miller (US Patent No. 5,796,340).
- Rejected claims 2 and 12 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Sackner (US 2002/0032386).
- Rejected claims 6 and 16 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Cornish (US 2006/0247543).
- Rejected claims 7, 8, 17 and 19 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Porges (US 4,510,944).
- Rejected claim 21 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Bridger (US 6,491,647).

I. Status Summary

Following the Office Action, the informalities in claims 7, 12 and 13 have been amended. Further, claims 1, 2, 4, 5, 7, 8, 10-17, 19 and 20 have been amended in order to clarify and more particularly indicate the claimed subject matter.

No new matter has been introduced by the new claims in the present amendment. Reconsideration of the application as amended and based on the arguments set forth herein below is respectfully requested.

II. Overview of the Current Invention

The object of the present invention is to monitor heartbeat and respiration rates of a patient lying, possibly sleeping, on a mattress. The system comprises an array of pressure sensors placed under a mattress on which the patient lies. The sensors are arranged to sense vertical pressure applied thereon. A control and processing unit is arranged to receive the vertical pressure measurements along time (hereinafter: vertical pressure signals) and calculate a horizontal signal therefrom, by subtracting one vertical signal from another vertical signal. Thus, the system and the method according to the present invention enable the extraction of horizontal movements of the body attributed to blood circulation by eliminating the common vertical movement components. The horizontal signal is then analyzed for detecting heartbeat rate.

In addition, the use of various filtering techniques is suggested in order to improve the analysis of the horizontal signal. Specifically, the use of a high pass filter whose frequency is at least twice the heart frequency of a predefined heartbeat rate (possibly the patient's) is suggested in order to detect the peaks along the horizontal signal caused by the heartbeats.

III. Claim Rejection under 35 U.S.C §102(b)

Examiner rejected claims 1, 3-5, 9-11, 13-15, 18 and 20 under 35 U.S.C §102(b) as being anticipated by Miller. According to the Examiner, Miller teaches a method comprising collecting pressure changes received from at least two sensors located beneath the patient's body and analyzing the difference the difference signal for identifying and detecting heartbeats or heart rate.

In response, Applicant has amended claim 1 to recite the step of collecting vertical pressure signals comprising vertical pressure measurements along time, and the step of generating at least one horizontal signal by subtracting at least one vertical pressure signal from another vertical pressure signal. The claim goes on to analyzing the horizontal signal for identifying and detecting the heartbeat rate. Thus, Claim 1 as amended enable the extraction of horizontal (or axial) movements from vertical pressure measurements. The extraction of horizontal movements, from which the

heartbeat is detected, is supported by the original disclosure of the present invention and found nowhere in Miller.

Claim 11 was similarly amended to recite that the sensors are arranged to sense vertical pressure signals comprising vertical pressure values along time and that the electronic mechanism is arranged to calculate a horizontal signal by subtracting one vertical signal from another vertical signal. Thus, as these limitations are found nowhere in Miller, claim 11 is structurally distinguishable from the prior art.

Similarly, amended claims 3-5, 9-10, 13-15, 18 and 20 now recite the above mentioned limitations *mutatis mutandis*, by virtue of their dependencies.

Therefore, withdrawal of the rejection under 35 U.S.C 102(a) is respectfully requested for claims 1, 3-5, 9-11, 13-15, 18 and 20.

IV. Claim Rejection under 35 U.S.C §103(a)

Examiner rejected claims 2 and 12 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Sackner. Applicant submits that claims 2 and 12 as amended by virtue of their dependencies are no longer anticipated by Miller and therefore are no longer unpatentable over Miller in view of Sackner.

Examiner further rejected claims 6 and 16 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Cornish. Applicant submits that claims 6 and 16 as amended by virtue of their dependencies are no longer anticipated by Miller and therefore are no longer unpatentable over Miller in view of Cornish.

Examiner further rejected claims 7, 8, 17 and 19 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Porges. Regarding claims 7 and 17, Applicant submits that Porges does not teach filtering using a high pass filter wherein the cut off frequency is twice as a predefined heartbeat rate. Rather, Porges teaches filtering in accordance with "twice the modal duration of the periodic process" (Column 13, Line 12). Porges relates to the duration and not to the frequency. Thus, Porges actually refers to a cut off frequency that is half of the predefined heartbeat rate. Therefore, Porges teaches away from the present invention in respect to the cut off frequency limitation.

Regarding claims 8 and 19, Applicant submits that claims 8 and 19 as amended by virtue of their dependencies are no longer anticipated by Miller and therefore are no longer unpatentable over Miller in view of Porges.

Examiner further rejected claim 21 under 35 U.S.C §103(a) as being unpatentable over Miller in view of Bridger. In response, Applicant submits that claim 21 as amended by virtue of its dependency is no longer anticipated by Miller and therefore is no longer unpatentable over Miller in view of Bridger.

Therefore, withdrawal of all rejections under 35 U.S.C 103(a) is respectfully requested.

Conclusion

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If an extension of time for this paper is required, petition for extension is herewith made. No fee is believed due. However, please charge any required fee (or credit any overpayments of fees) to the Deposit Account of the undersigned, Account No. 500601 (Docket No. 7044-X06-010).

Respectfully submitted,

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